CHA E-Gun SOP

1. Scope

1.1 This document provides the procedure for operating the CHA E-Gun.

2. Table of Contents

3. Reference Documents

3.1 Referenced within this Document

3.1.1 None

3.2 External Documents

3.2.1 None

4. Equipment and/or Materials

4.1 CHA E-Gun

4.2 Wafer/Sample

4.3 Target Material

4.4 Crucible

5. Safety

5.1 Follow all Nanofab safety procedures.

6. Setup Procedures

6.1 Record Information in Log Book

6.1.1 Record all setup and processing information in the log book.

6.2 Vent the Chamber

6.2.1 Turn off the ion gauge (IG1). See *Figure 1*.

6.2.2 Close the HI-VAC valve. See *Figure 1*.

6.2.3 Vent the chamber by moving the VENT switch to the OPEN position. See *Figure 1*.

6.2.4 The convectron gauge will show an increase in the chamber pressure.

6.2.5 When you hear purge gas escaping from the bell, move the vent switch to the CLOSE position.

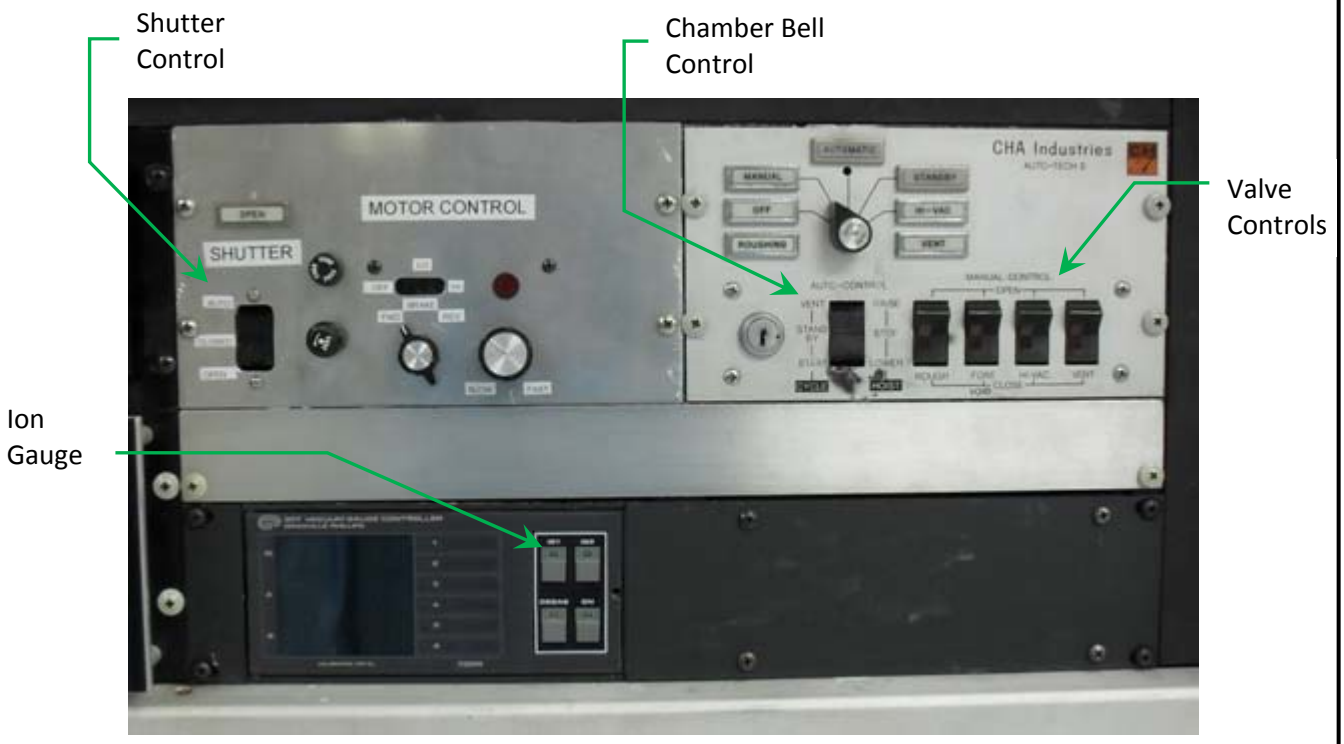

Figure 1, Right Side Control Panel

6.3 Load the Chamber

6.3.1 Raise the bell by moving the HOIST switch to the RAISE position. See *Figure 1*.

6.3.2 Secure substrate in the spring clips.

6.3.3 Open the shutter by moving the SHUTTER switch to OPEN. See *Figure 1*.

6.3.4 Place evaporation material in the crucible.

6.3.5 Close the shutter.

6.3.6 Lower the bell with the HOIST switch.

6.3.7 Move the HOIST switch to the STOP position.

6.4 Pump Down Chamber

6.4.1 Start the Mechanical Pump by turning power to on. See *Figure 3*.

6.4.2 If the pump turns itself off, turn it back on.

6.4.3 Open the ROUGH valve. See *Figure 1*.

6.4.4 When chamber pressure reaches 50 mTorr close the ROUGH valve.

6.4.5 Turn off the mechanical pump.

6.4.6 Open the HI-VAC valve.

Figure 2, Left Side Control Panel

6.5 Set Deposition Program Parameters

6.5.1 After waiting 45 minutes, turn on the ion gauge (IG1) only. See *Figure 1*.

6.5.2 Wait for the pressure to drop to about 2x10-6 Torr.

6.5.3 Press DSPL to enter the DISPLAY INDEX menu on the INFICON 6000 controller. See *Figure 2*.

6.5.4 Press 1-6 to select the number of the film program you wish to change (Film #5 is Aluminum).

6.5.5 Enter the code 1234 and press E to unlock the program.

6.5.6 To change a parameter, move the cursor with the up or down arrow key to select a parameter.

6.5.7 Enter the new value with the keypad and press E.

6.5.8 The parameter definitions are found in the INFICON controller manual.

6.5.9 After changing the desired parameters, exit the film program and return to the DISPLAY INDEX by pressing DSPL.

6.5.10 Press 8 to view the DATA screen, and select the film number you wish to use by pressing FLM# and the desired program number.

Figure 3, Bottom Control Panel

7. Film Deposition Procedures

7.1 Load substrate, deposition material, and pump down chamber (see section 6).

7.2 Turn on INFICON 6000 controller and press 8 to display DATA screen. See *Figure 2*.

7.3 Select the film to be deposited by pressing FLM followed by the appropriate number. Use film number 1 for Aluminum.

7.4 Turn on the Telemark TT3 power supply. See *Figure 2*.

7.4.1 Turn on the power supply controller using the toggle switch in the center of the sweep control unit.

7.5 Wait 2 minutes for the power supply to warm up.

7.6 Turn on the emission voltage on the sweep controller.

7.7 Adjust the voltage by slowly turning the knob on the front of the Telemark TT3 power supply clockwise until the display on the sweep controller reads to 7.5 kV.

7.8 Center lateral and longitudinal LEDs using joystick.

7.9 Adjust the current by turning the Emission Current ADJ knob clockwise until it reads 10-20 mA.

7.10 Look through the window to make sure the beam is centered on the crucible and wait for it to glow orange.

7.11 Slowly adjust the Emission Current 5 to 10 mA at a time.

7.12 Press the MAN button on the INFICON controller.

7.13 Press the ZERO THK button on the INFICON to zero the crystal thickness monitor.

7.14 If desired, turn the MOTOR CONTROL to LO, and move the direction knob to FWD or REV to rotate the samples during deposition.

7.15 Open the shutter to begin deposition.

7.16 The INFICON controller will monitor the deposition rate, and deposition thickness.

7.17 To increase the deposition rate, increase the Emission Current.

8. Shutdown Procedures

8.1 At the desired deposition thickness, close the shutter and SLOWLY decrease the Emission Current.

8.2 Turn off the MOTOR CONTROL (if used).

8.3 Slowly decrease the Emission Voltage.

8.4 Turn off the Emission Voltage and wait 2 minutes.

8.5 Turn off the ion gage (IG1).

8.6 Close the HI-VAC valve, and vent the chamber.

8.7 Raise the bell and remove the substrate and replace the lower two glass slides.

8.8 Lower the bell and rough the chamber to about 50 mTorr.

8.9 Close the rough valve.

8.10 Turn off the mechanical pump.

8.11 Open the HI-VAC valve and leave the chamber under high vacuum when you are finished.

9. Process Notes

9.1 Typical Film Characteristics

9.2 Process Summary

10. Revision History

Rev	Date	Originator	Description of Changes
1	22 Jan 2010	Sam Bell	